

E1 210

Measurements of lightning peak currents in the first return stroke of negative cloud to ground flashes

Measurements of lightning generated electromagnetic fields were carried out using an LLP lightning detection network consisting of two wideband magnetic direction finding (DF) stations installed at Colombo (6.90N, 79.89E) and Ratnapura (6.68N, 80.40E). A DF station provides information such as time of occurrence, direction, strength, multiplicity and polarity of CG flashes. The peak current is usually observed when the lightning strike is about a few tens of meters from the ground level. Only flashes that lower net negative charge to ground was considered.

The measurements were carried out during the months of February, March, April, May, June, July, August, September and October in 1999. The time of occurrence and the polarity were used as the main criteria to match the CG flashes recorded in two stations. A total number of 1653 records satisfied this condition. The data shows the lightning peak current measurements are easily affected by the trigger thresholds, which fail to trigger the measuring electronics for weak signals that propagate long distances over ground. The best range with maximum efficiency is found to be from 20 km to 120 km. Within this range, the average peak current in the first return stroke of negative CG flashes is 30 kA for Sri Lanka